



MEMORANDUM

TO: Sylvia Limon, Case Manager
Development Services Department

FROM: Sylvia R. Pope, PG, Hydrogeologist Reviewer
Watershed Protection Department

DATE: September 17, 2015

SUBJECT: Response to Citizen Comments on Flood Complaints and Austin Caverns concerns near Resubdivision of Lot 12, Block D, Lakeshore Village, Case Number C8-2015-0048.0A

Item C11 on the September 8, 2015 Planning Commission agenda was postponed for consideration on September 22, 2015. The postponement was in response to two citizen comments regarding the localized flooding occurring across the street from the proposed resubdivision of Lot 12 and concerns raised regarding Critical Environmental Features. This memo provides a brief summary of my inspection of the tract, some historical information regarding Austin Caverns and occurrences of localized flooding in the vicinity of 3600 Meredith Street. I've attached 2 maps and an internal 2011 Watershed Protection Department memo for reference. Information regarding the proposed neighborhood stormsewer improvements may be viewed at <https://www.austintexas.gov/department/meredith-street-storm-drain-improvements>.

Critical Environmental Feature Review

The applicant requested a waiver from the requirement to submit an Environmental Resource Inventory (ERI). I walked the property with Mr. Hector Avila on April 20, 2015 in order to look for surface indicators of karst features that may be associated with Austin Caverns, even though cave footprint is primarily below homes located immediately west of 3600 Meredith Street. Due to the fact that the 1954 cave map shows that the cave passage ceiling is approximately 30 to 40 feet underground, there was an interest in finding surface features that may be connected to the cave. However; no fractures, depressions, solution cavities or sags were found. The house, built in 1948, did not have visible indicators of subsidence such as siding separation, tilted window or door frames or repaired cracks. Therefore, a waiver was granted on April 20, 2015. My only review comment was to add the Void and Water Flow Mitigation Rule note.

Localized Flooding

At the September 8, 2015 meeting the first citizen, Mr. Olbert, mentioned localized flooding and the proposed drainage improvement project. I've attached a memo that summarizes the flood complaints at 3605 Meredith Street and the reasons for the localized flooding. There are two residences at this location that flood due to the topography, the capacity of the older stormsewer system and the reduced

capacity of the cave passages of Austin Caverns at 3605 Meredith Street. The Meredith Street Drainage Improvement Project recently finished the preliminary design phase and the engineering design work is in progress. The project will provide partial flood relief for the residences and improved stormwater conveyance for the affected portion of the neighborhood. The anticipated completion date is Spring 2018.

The second citizen that spoke on September 8, Ms. Hallman, lives at 3605A Meredith Street and has suffered repeated episodes of flooding. That night, she said that she had been unable to live at her home since Memorial Day 2015 due to the foot of water that flooded her home during that storm. Understandably, she is concerned regarding any development activity that may contribute to the flooding. Ms. Hallman recollected that the flooding started after the demolition of a smaller home and construction of 2 larger homes in the 3700 block of Meredith Street in 1998. She mentioned that a passage of Austin Caverns had been filled in with concrete during construction of that home. I spoke with her on September 17, 2015 regarding the incident. The developer of the homes at 3712 and 3714 Meredith Street is rumored to have filled a gully and a possible solution cavity at the bottom of the gully with bags of concrete. The 3712 residence, built in 2006, and the 3714 residence, built in 2005, list Hunter Wheeler as the general contractor in the City of Austin AMANDA database. There is a complaint of a non-compliant foundation at 3714 Meredith listed in the AMANDA database that may be related to the gully filling activity but the case was closed due to lack of evidence. It is difficult to speculate whether the filled feature met the City of Austin definition of a Critical Environmental Feature at this point. The footprint of the mapped passages of Austin Caverns do not extend east and in the direction of 3712 and 3714 Meredith. At this time, it is unknown whether this activity had a direct impact on the frequency and magnitude of flooding at 3605 Meredith Street. Nonetheless, the increased amount of impervious cover due to redevelopment may contribute to flooding events.

Past drainage conveyance work

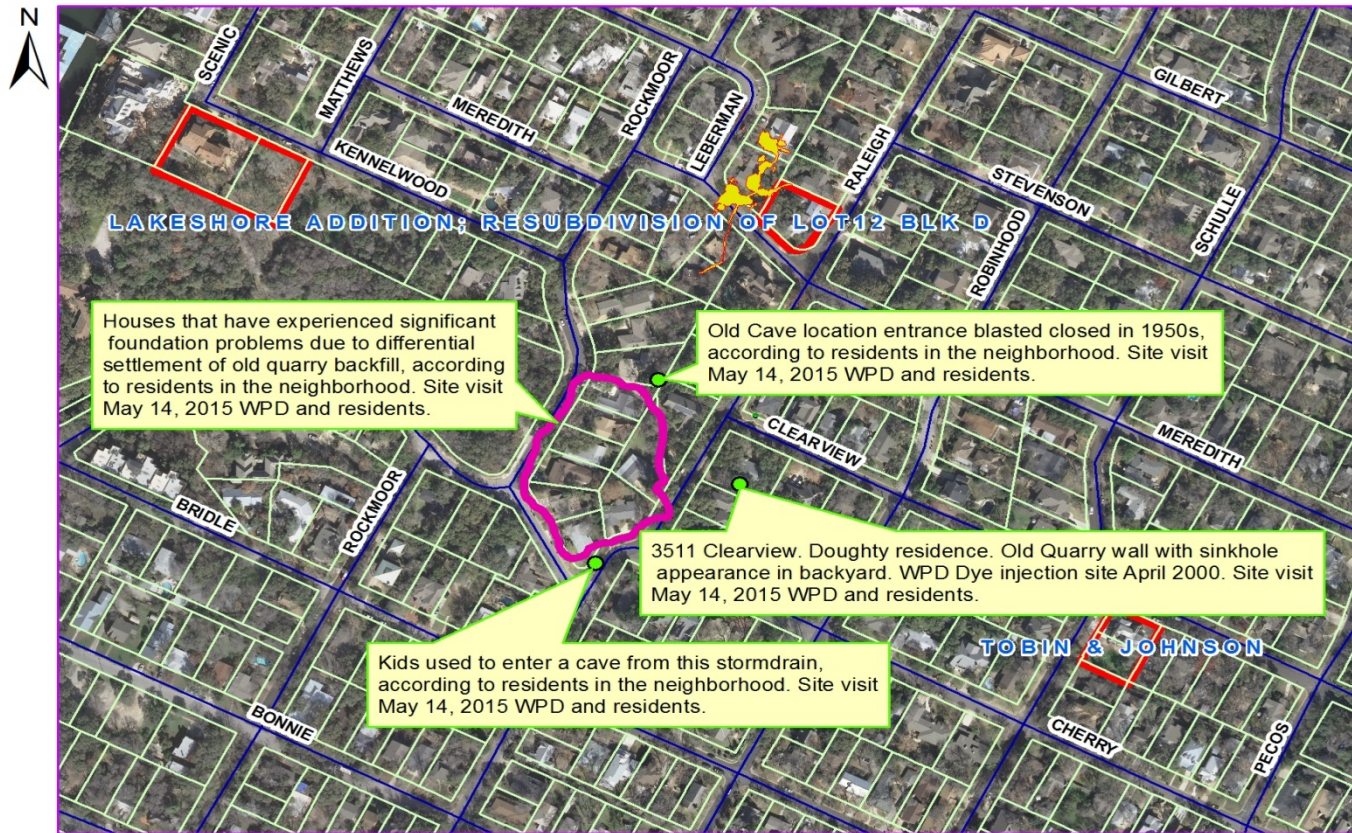
The Watershed Protection Department hired a contractor to dig out leaves, trash and earthen debris (sand, soil, gravel) from the southern passage of Austin Caverns in 2004. This action did not significantly increase the stormwater conveyance capacity and residents continue to flood. The larger passages to the north of Meredith Street have been inaccessible since the 1990s when roadwork near the stormwater inlet/cave access resulted in blockage with boulders and rock debris. Today, the cave may still be visited occasionally by Texas cavers but City staff haven't entered the cave since 2004.

Attachments:

- A. Overview of Lakeshore resubdivision, C8-2015-0048.0A, and Austin Caverns and quarry cave reports
- B. Land contours and building footprint comparison near Lakeshore resubdivision, C8-2015-0048.0A
- C. May 31, 2011 Watershed Protection Department memo, "Summary of Flood Complaints and Austin Caverns Investigations at 3600 Block of Meredith Street, Austin, TX"

Attachment A.

Overview of Lakeshore resubdivision, C8-2015-0048.0A, and Austin Caverns and quarry/cave reports



0 250 500 Feet



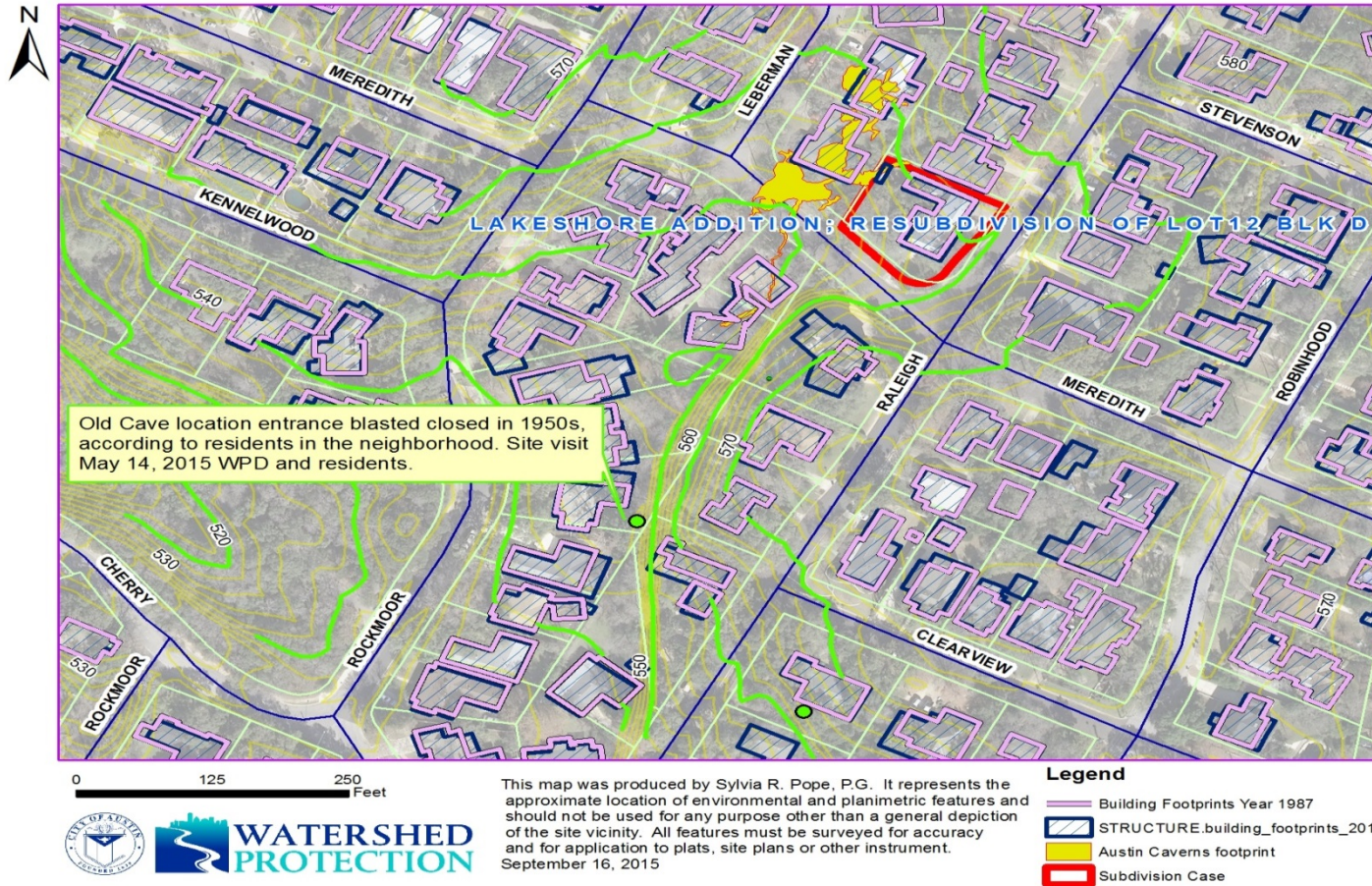
This map was produced by Sylvia R. Pope, P.G. It represents the approximate location of environmental and planimetric features and should not be used for any purpose other than a general depiction of the site vicinity. All features must be surveyed for accuracy and for application to plats, site plans or other instrument. September 16, 2015

Legend

- Austin Caverns footprint
- Subdivision Case

Attachment B.

Land contours and building footprint comparison near Lakeshore resubdivision, C8-2015-0048.0A





MEMORANDUM

TO: Kevin Shunk, PE, CFM

FROM: Karl McArthur, PE, CFM; John Beachy; and Sylvia R. Pope, PG

DATE: May 31, 2011

SUBJECT: Summary of Flood Complaints and Austin Caverns Investigations at 3600 Block of Meredith Street, Austin, TX

The storm drainage system that connects to the Austin Cavers at 3607 Meredith serves a drainage area of approximately 16.24 acres along Raleigh, Meredith and Stevenson Streets. The system has been connected directly to the underlying cave and has no other path for outfall than through the residential properties in the low area to the southwest. Several options have been considered for improvement of the drainage conditions in the area. However, each presents significant challenges. Cleanout of the cave in order to maintain adequate drainage has met with limited success. Connection of the system to the downstream system along Rockmoor would require either purchase of property or easements between Meredith and Rockmoor or extensive trenching up-grade to connect the system northeast along Meredith and then southwest along Rockmoor. Either option would require enlargement of the downstream system. Construction of either option would likely be complicated by the uncertain subsurface conditions in the area.

Key events in the history of this drainage system and the drainage complaints and investigations associated with it are summarized below.

- Early 1950s – Filling and reclamation of abandoned quarry at site.
- 1952 – Drainage system constructed.
- 1960's – Drainage system directly connected to Austin Caverns.
- 1990's – Cavers explored the cave up until the mid 1990's.
 - Around this time, significant roadwork was performed along Meredith Street in the immediate vicinity of the storm drain stand pipe. It is possible that fill material from the roadway construction entered the system and blocked drainage to the North Caverns of the cave system at this time. According to Sylvia, Street and Bridge was not able to locate records of this roadway project.
 - A wastewater project (project manager - Bob Lamb) was planned for the area in the mid- to late-1990s. The geotechnical contractor was unable to complete the boring and test excavation work for the project due to the unstable nature of the subsurface conditions. The project was abandoned.
- July 11, 1996 – First recorded flooding complaint from residents on Meredith Street. City crews cleaned the inlets and flushed the lines.

- December 1998 – Site visit to discuss clogged cave passage at Austin Caverns, 3607 Meredith St. Bill Russell, local caver, asked City of Austin staff (Sylvia Pope, David Johns, Mike Kelly and Roxanne Jackson) to investigate how to open up cave passages that had become blocked by debris and rock collapse at the base of the 23.6-foot deep vertical inlet structure. Residents of the duplexes came out to inform City staff about frequent flooding. Complaint passed to Mike Newman, Watershed Engineering, for consideration as a CIP project.
- April 2000 – Dye trace injection into Austin Caverns. The dye was never recovered at any of the 26 receptor locations. The most likely outlet was Lake Austin.
- August 28, 2001 – Additional flooding complaints received and referred to WED.
- November 15, 2001 – Additional Flooding complaints, first CAF.
- May 6, 2002 – CAF 12089 Director Heitz, Mike Newman, and George Oswald meet with citizen and state that this area has been identified in the Master Plan.
- June 15, 2004 – CAF 15254 Councilmember Dunkerly, Assistant City Manager Laura Huffman and George Oswald informed citizen that they do not anticipate funding for this project for 10 or more years. Two additional requests were made by citizen: 1) Explore cleaning out debris from the cave, 2) Provide advice to impacted homeowners. Refer to July 30, 2004 memo from Laura Huffman to Mayor and Council for additional details.
- June 2004 – TCEQ Injection Well Permit section sent a letter to City of Austin regarding Class V injection well sites. Staff visited Austin Caverns to investigate current conditions. Photographed interior of south cave passage from inlet pipe. Accumulation of debris (sand, leaves, dirt) from surface runoff visible in cave passage. Refer to TCEQ letter for additional details.
- July 2004 – Site visit with TCEQ Injection Well Permit staff to discuss Class V injection well status of Austin Caverns. Subsequently, COA sent an application for Class V injection well status. Sylvia Pope developed specification for cleanout of the cavern in anticipation of hiring a contractor for this work.
- September 2004 – Contractor for Watershed Protection Department removed approximately 4.5 cubic yards of debris from Austin Caverns and mapped the accessible portion of the south cave passage. Refer to the October 2004 report from Karst-Tec Consultants and the specification developed for this work for additional details.
- Ongoing since 2004 – A number of additional complaints by residents in the area have been logged. Vactor truck crews periodically attempt to remove leaves and debris from Austin Caverns.
- February and March 2011 – LFHM group performed field reconnaissance and developed StormCAD and InfoWorks modeling for the existing system (including the downstream system along Rockmoor Avenue and Cherry Lane). Refer to the flooding issues identified through this modeling, which are included at the end of this document.
- May 2011 – An approximately ½ inch rainfall event produced street and yard flooding in the area immediately downstream of the inlet. Subsequent investigations by field operations indicated that additional cave-ins of the cavern roof had likely occurred and that the 18-inch elbow outfalling to the cave was significantly blocked by a large boulder.

Flooding Issues Identified through InfoWorks SD Modeling

Rainfall Event	Flooding Impacts
<i>Existing System</i>	
100-year	9 houses flooded with maximum flood depth of 1.09 ft
25-year	5 houses flooded with maximum flood depth of 0.95 ft
10-year	3 houses flooded with maximum flood depth of 0.65 ft
2-year	1 house flooded with maximum flood depth of 0.56 ft
<i>Existing System with Clogged Inlet at 3605 Meredith</i>	
100-yr	9 houses flooded with maximum flood depth of 1.10 ft
25-yr	6 houses flooded with maximum flood depth of 0.96 ft

